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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/532,022	03/21/2000	Yuji Sudoh	35.G2558	7470

5514 7590 03/12/2002

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EXAMINER

NGUYEN, HUNG

ART UNIT PAPER NUMBER

2851

DATE MAILED: 03/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/532,022

Applicant(s)

SUDOH ET AL.

Examiner

Henry Hung V Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2002.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4, 6-8, 11-15, 17-19, 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ushida et al (U.S.Pat. 5,530,518) in view of Shiraishi (U.S.Pat. 6,020,950).

With regard to claims 1-4, 6-8, 11-15, and 22 Ushida et al (fig.1) discloses an projection exposure apparatus comprising: a projection optical system (10) for projection a pattern formed on a reticle (9) onto a photosensitive substrate (11) and a diaphragm (10a) for setting the numerical aperture of the projection optical system. Ushida lacks to show a mechanism for controlling the temperature of the diaphragm. Shiraishi (figs 4 and 5) teaches a projection optical system having a cooling member (see fig.5) for cooling the light shielding plate arranged therein whereby "the system is free from heat generation caused by light absorption" (see col.5, lines 15-18) wherein the cooling means comprises a cooling fluid circulation system (Ko,Ki).

With respect to claims 6 and 17, it is noted that the temperature of fluid is controlled (see col.14, lines 5-7). Therefore, a temperature sensor is an inherent device of the cooling means to detect the temperature information of the light shielding plate.

As to claims 7-8, and 18-19, it is the examiner's position that it would have been obvious to a skilled artisan to preferably disposed the temperature sensor on the side facing the substrate.

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In other words, the sensor is disposed on a plane opposite to the light source whereby the sensor is not influenced by the exposure beam.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Ushida et al and Shiraishi et al to obtain the invention as specified in claims 1-4, 6-8, 11-15, 17-19 and 22-24 of the instant invention. It would have been obvious to a skilled artisan to utilize the cooling means as taught by Shiraishi into the diaphragm of Ushida so that the numerical aperture diaphragm may be prevented from increasing its temperature due to absorption of light and thus a deviation of the projection optical system can be avoided.

3. Claims 5, 9-10 and 16, 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ushida et al (U.S.Pat. 5,530,518) in view of Shiraishi (U.S.Pat. 6,020,950) and further in view of Nishi et al (U.S.Pat. 5,894,341).

As to claims 9-10, and 20-21, Ushida et al as modified by Shiraishi comprising substantially of the limitations of the instant invention as discussed above except for the aperture diaphragm comprises an iris diaphragm and a turret having a plurality of openings. However, a variable aperture of a turret type is known per se. For instance, Nishi teaches an aperture comprising "iris diaphragm and a turret with a plurality of openings". (see figs.2a, 2b). It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a variable aperture of a turret type as taught by Nishi in the device of Ushida as modified by Shiraishi for varying the numerical aperture of the projection optical system.

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As to claims 5 and 16, Ushida et al as modified by Shiraishi lacks to show a cooling device with a "Peltier element". Using a "Peltier element" in a cooling mechanism is also well known in the art. For example, Nishi teaches Peltier element (30) for cooling the bottom face of the temperature adjustment plate (20). It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ "Peltier element" as taught by Nishi into the cooling device of Shiraishi for the purpose of cooling the aperture stop and thus the aperture stop can be prevented from increasing its temperature due to absorption of light.

### *Response to Amendment*

4. Applicant's amendment filed January 8, 2002 have been entered. Claims 1, 6 and 12 have been amended. New claims 23-24 have been added. Applicant's arguments have been carefully reviewed but they are not found to be persuasive. Applicant merely repeated the claim limitations and stated that the cited art does not teach or suggest "such features of the present invention". Applicant is reminded the rejection here is made under 35 U.S.C. 103(a). Therefore, the issue here is whether or not one of ordinary skill in the art would incorporate the teachings of the prior arts as taught by Ushida, Shiraishi (and Nishi) to come up with the instant invention. Applicant's arguments is absolutely silent in respect to this issue and only against the references individually, but one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). As clearly indicated in the office action, Ushida teaches a diaphragm (10a) for setting the numerical aperture of the projection optical system; Shiraishi teaches a mechanism

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including a heat moving device (Gb) located between the outer edge and the opening of a light shielding plate placed in the projection lens for cooling off the light shielding plate. In lithography art, since “the diaphragm” for setting the numerical aperture of the projection optical system and “the light shielding plate” in a broadest sense, both may be regarded as “plate like member” and are deformed by same effects such as thermal expansion caused by exposure light. The solving solution for the “light shielding plate” would be the same for the “diaphragm”. Therefore, it would have been obvious to a skilled artisan to employ the mechanism for cooling off the “light shielding plate” as disclosed by Shiraishi for the same purpose of cooling off the “diaphragm” of Ushida. The person having ordinary skill in the art is usually a graduate engineer. The examiner fails to find applicant’s arguments convincing that the claimed invention would have been unobvious to such a person and “the Shiraishi patent adds nothing to the teaching of Ushida”. For the reasons set forth above, the rejections under 35 U.S.C. 103 are maintained.

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Henry Hung V Nguyen whose telephone number is 703-305-6462. The examiner can normally be reached on Monday-Friday (First Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams can be reached on 703-308-2847

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4900.

hvn  
March 8, 2002

  
RUSSELL ADAMS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800